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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,360	03/12/2004	Kunihiko Kodama	Q80432	5628

23373 7590 06/21/2005

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EXAMINER

ASHTON, ROSEMARY E

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,360

Applicant(s)

KODAMA, KUNIIHIKO

Examiner

Rosemary E. Ashton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/12/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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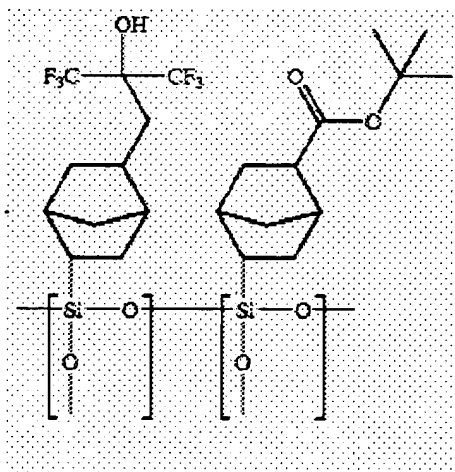
DETAILED ACTION***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 7, 9-11, 13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanagasabapathy et al application publication no. US 2004/0224255 A1, filing date 2/23/03.

As shown in Example 5 (section 131) Kanagasabapathy teaches a photosensitive photoresist composition comprising the silicon and fluorine containing polymer shown below. The polymer has acid labile t-butyl groups meeting the limitations of component B in claims 1-3.



The composition has a sulfonium photoacid generator (PAG triphenylsulfonium nonaflate), a base (Troeger's base) and a solvent having a carbonyl group (2-heptanone).

Kanagasabapathy teaches the amount of each reagent in units of parts, not parts by weight as in the invention, however, in the art "parts" usually means "parts by weight" and the examiner treats them as being the same in this rejection. Using the "parts" in ex. 5 of Kanagasabapathy the examiner obtains the results for formulas 1-3 (shown below) in claims 1-3 of the instant application. The results for formulas 1-3 are: formula 1 is 0.131, formula 2 is 0.180 and formula 3 is 0.045. There are 3 aromatic rings in the

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PAG. The results for formulas 2 and 3 are in the claimed range, however, the answer for formula 1 is 0.03 greater than the 0.10 as the range in formula 1 is 0.03-0.10.

$$(a+b+c)/(a+b+c+d)=0.03 \text{ to } 0.10 \text{ (1)}$$

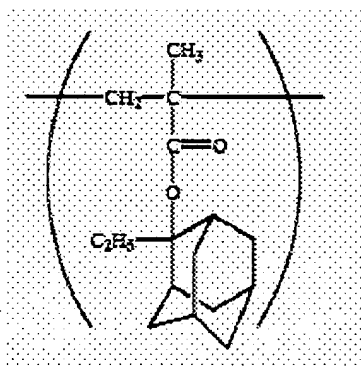
$$[(\text{Number of aromatic ring included in molecule of Component A}+1).\text{times.a}]/(a+b+c)=0.05 \text{ to } 0.80 \text{ (2)}$$

$$(a+b+c)/(a+b+c+d)=0.03 \text{ to } 0.10 \text{ (1)} a/(a+b+c)=0.03 \text{ to } 0.20 \text{ (3)}$$

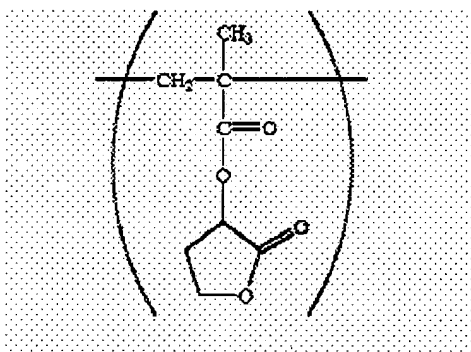
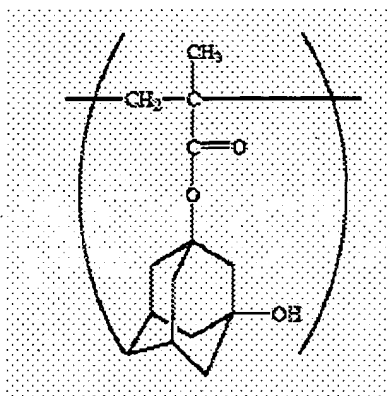
However, it would have been obvious to one of ordinary skill in the art to optimize the amount of reagents in Kanagasabapathy with a reasonable expectation of obtaining a working photoresist composition having enhanced resistance to plasma etching (abstract) because optimization of the amounts of reagents in a photosensitive composition is well known in the art and therefore such optimization would have been obvious to one of ordinary skill in the art.

3. Claims 1-6,10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uetani et al. patent no. 6,383,713.

In col. 12 and 13 Uetani teaches resin C having a hydroxy-adamantyl monomer, a γ -butyrolactone monomer and a 2-ethyl-2-adamantyl monomer which is an acid labile group, as shown below.



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In col. 15, lines 45-67 Uetani teaches a resist composition comprising resin C, acid generator PAG4 which is 4-methylphenyldiphenyl sulfonium nonaflate (col. 13, line 62), 2,6-diisopropyl aniline as a basic compound for performance adjusting and a mixture of PGMEA and γ -butyrolactone as the solvent. A lactone is a cyclic ester and is used to reject claim 12. PGMEA ($\text{H}_3\text{C}-\text{CH}(\text{OCOCH}_3)-\text{CH}_2-\text{O}-\text{CH}_3$) has an ester group and a carbonyl group, both in the acetate group and γ -butyrolactone has a cyclic ester group as in claims 13 and 14. Alternatively, γ -butyrolactone has a carbonyl group and PGMEA has an acetate group which is an ester.

Uetani teaches the amount of reagents in mole units and does not teach the amount of reagents in the resist composition in parts by weight as in formulas 1-3 in claims 1-3 of the instant application.

However, it would have been obvious to one of ordinary skill in the art to optimize the amount of reagents in Uetani with a reasonable expectation of obtaining a working photoresist composition having good resolution upon exposure by an ArF laser and little substrate dependency (abstract) because

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optimization of the amounts of reagents in a photosensitive composition is well known in the art and therefore such optimization would have been obvious to one of ordinary skill in the art.

4. Claims 1-3,8,10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki et al., EP 0942329 A1, published 9/15/99.

Okazaki et al. teaches a method of preparing a positive working photoresist composition where the reagents in the photoresist, i.e. the PAG, are added to the polymer without purification of the polymer (page 3, section 8).

On page 10, example 1, Okazaki et al. teaches a polymer for use in a resist composition. The polymer is:

poly[p-[1-(2-chloroethoxy)ethoxy]styrene-p-hydroxystyrene]

The polymer has phenolic groups and acid labile ethoxyethoxy groups.

In section 49 on page 11 the polymer is mixed with the following reagents. TPSA is a basic compound as shown in section 38.

[0049] 0.063 g of triphenylsulfonium trifluoromethanesulfonic acid (ZK 9302; manufactured by Dainippon Pharmaceutical Co., Ltd.) (acid generator), 0.918 g of 0.1 mmol/g triphenyl sulfonium acetate (TPSA) solution in PGMEA, 0.153 g of 0.2 % Megafuck solution (trade mark, an agent for improving affinity for substrate and a film-forming property upon spin-coating a resist) were added to 30 g of the solution produced in the above process, and the solid contents were adjusted to 15.5 % with PGMEA to give a photoresist solution.

Okazaki does not teach the amount of reagents in the resist composition in parts by weight as in formulas 1-3 in claims 1-3 of the instant application.

However, it would have been obvious to one of ordinary skill in the art to optimize the amount of reagents in Okazaki with a reasonable expectation of obtaining a working photoresist composition having good resolution upon exposure by an KrF laser (section 50) because optimization of the amounts of reagents in a photosensitive composition is well known in the art and therefore such optimization would have been obvious to one of ordinary skill in the art.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 571-272-1326. The examiner can normally be reached on Mon-Fri, 11:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

June 19, 2005

**ROSEMARY ASHTON
PRIMARY EXAMINER**